

1 AGCTTTATAA CCATGTGATC CCATCTTATG GTTCAATCC ATGCACAGGA
51 GGAAAATTGT GGGCACGAAG TTTCCAAAGG GAAAATTTAT AGATTGGTAG
101 TTAATGAAAT ACAGTTTTCC TCCTTGGCAA ATTTAATTTA CTAGCTTCAC
151 TGTATAGGAA AAAGCAGGAA AAAAATTAAA ACCAACTCAC CTCCAAACCT
201 GTTTTGAGCT TTTACTTGTC TGCCCAATTG ATAGTTTCTA CTCTCTGCTT
251 TTGATGAAAA TATTTTTTAT TATTTTAATG TAACCTCTGA AAATAAATT
301 ATCTAGAAGC AAATAAAAAG ATATTGCTTT TATAGTTCCC AGAAGGAAAA
351 AACAAACACT AGGAAAGTTC TATCTATCAG ATGGGGGAGA TGTGATGGAG
401 GCAGTGATAT TTGAGCTGAG CCTTGAACAA TGAACAGGAG TCTACCAAGC
451 GAGAGGCTAG CGGGTGGCCC TCAAGATAAA ACAACAGCAT GTACAAAGGC
501 ATGGAGACAT ACACATCTTG ACTTTCCAG GAATGGTGGG AACGCTGGTG
551 GAGCTAGAAT GTAGGTACAT AECATAAAGT GGCAGACGGG AAGCCTTTGG
601 AAATCTTATT ACATAGGACC CTGGATGCCA TTCCAATGAC TTTGAATTTT
651 CTGTAGGCTG CCAGCGAAT TTCCAAGCGT GATAGAGTCA TGTCTATCTA
701 TGCACTTCAG AAAGACAACC TCAGGGTTAA TGAAGAAAAT GCATTGGAAT
751 ATAAGAAACT GGTGACCAGA GTGATCAATT GCATGACTGT TGTGAAAGTC
801 CAGGTGAGGG GAGCTGTGGG CAAGGTCAGA GTTGAGAGGC ATTTAGAGA
851 TAAAATGACA GTAACAAAGT AGATGTCAGG CTGAGAAGAA AGGGCTGTAC
901 CAGATATATG GTGCTATCAT TAAGTGAGCT CAACATTGCA GAAAAGGGGT
951 AGGTTTGGTG GGAGTTGCTC ACAAACATG TTTAGTCTAA GCAAACCAT
1001 TGCCATGGGC TCAGATAAAA GTTAAGAAGT GGAAACCATT CCTACATTCC
1051 TATAGGAGCT GCTATCTGGA AGGCCTAGTA TACACGTGGC TTTTCAGCTG
1101 TGATTTTGTG TGATTTTAGG GATTATTCTT TTTCTGAATC TGAGCAATGT

FIG. 1

1151 TAGCGTGTAA AATACTCACA CCCACAGCTT TGAAGGGTG AGAAGTTATC
 1201 ATAAATCATA TTGAGTTTGT TGTGATACCT TCAGCTTCAA CAAGTGATGA
 1251 GTCAGGTCAA CTCCATGTGA AAGTTCCTTG CTAAGCATGC AGATATTCTG
 1301 AAAGGTTTCC TGGTACACTG GCTCATGGCA CAGATAGGAG AAATTGAGGA
 1351 AGGTAAGTCT TTGACCCAC CTGATAACAC CTAGTTTGAG TCAACCTGGT
 1401 TAAGTACAAA TATGAGAAGG CTTCTCATTC AGGTCCATGC TTGCCTACTC
 1451 CTCTGTCCAC TGCTTTCGTG AAGACAAGAT GAAGTTCACA GTGAGTAGAT
 1501 TTTTCCTTTT GAATTTACCA CCAAATGATT GGAGACTGTC AATATTCTGA
 1551 GATTTAGGAG GTTTGCTTCT TATGGCCCCA TCATGGAAAG TTTGTTTAA
 1601 AAAAATTCTC TCTTCAAACA CATGGACACA GAGAGGGGAA CAACACACAC
 1651 CAGGTCCTGT TGGGGGGTGG AGAGTGAGGG GAGGGAAGT AGAGGACAGG
 1701 TCAATAGGGG CAGCAAACCA CCATGGCACA CATATACCTA TGTAACAAAC
 1751 CTGCACGTTC TGCACATGTA TCCCTTTTTT TTAGAAGAAG AAATAATGAA
 1801 AAAAAACCTT TTTTCTATTT ATATAATCAT GGCATTTATA AGCATCTCTA
 1851 TAGAGAAGGA TAATTGTGCT GAGATTAGAC AGCTGTCTGA GCACCTCACA
 1901 CTGACCTATT TTTAACAAAA TGACTTTCCA CATCACCTGA TTTCGGCTCC
 1951 ATGCRGGGTA AGCAGTTCCT AAGCCCTAGA AAGTGCCGAT CATCCCTCAT
 2001 TCTTGAATTC CTCCTTTTAT TTACCAAAT TCCTGAGCAT GTTCAGGAAA
 2051 GATGAAAAGC TTATTATCAA AATAAGTGGC TGAGATAGAC TTCTTGTCAC
 2101 ATTTGTTACA GTAAATGGG TCTCCAAGAA AGAAAGATTT GCCTTGGGCT
 2151 CTAGCATGGC CATTTATTTA AGAAAGCATC TGAAACATGA AGCTACCACA
 2201 GCATCTCTCC TGTGGTTCCA GACGGAAGCC TGAGAGTCTA GGAGGAGGTG
 2251 GACCGAGAAA CCCTGCCAAA GTAAGTAGTA GTGCCGGGT TCTCACAACA
 2301 CGATGCAAAG GGGCTAGAAT CAGATGACTA TTTTCATGTT TCAACATACT

FIG. 1 Cont.

2351 ACACACTGGA AAACGTTACG GCAGACTCTA CTTTATAATG GGGCTGCAAA
 2401 TGTAATGA CTACTAGAAC TAGGTCCTCT TAATAGCAGC AAAGTTTAAA
 2451 AGGGTCAGAG GGAGCTCCAG ACACAGGTTA GATTGATTT CTCTCCTAGT
 2501 TCTGCTGTGA ACAAGAGGTA TAAGTTTGGC CAACTCACTT AACCCTGAA
 2551 GCTCAGTTAC CTTATCTGTA AAATGATTGC ATTGTACTAG GTGTTCTCTA
 2601 AAATTTCTTC TACCTCTGAC TTTTAGGAG ACTAATTTT AACTCCTTT
 2651 TAAGCTATTG GGAGAAAAAT TTAATTTTTT TTCAAAAGTT ACCTTGAATC
 2701 TCTAGAGCAG TTCTCAAAC TATTTGTCC CAGGCAAAGG AAATGAGACT
 2751 AGGTACCCAG AATGAGGCAC CCTGCATAAA GCTCTGTGCT CTGAAACCA
 2801 ATGTCAGGGA CCCTGTGATA AATAATTAAA CCAAGTATCC TGGGACACTG
 2851 CTAGTGACAT CGCCTCTGCT GATCACTCTT GCCAGCGAGA CACTCTATAC
 2901 TTGCTTTCTC ATCATTGGCA TCCAACTGC CTAATAATCC ATTGCTTTGG
 2951 AAAGTTTTT TTAATAAAAA GATTATTTCT ATTAGGAGGA AAACATCCCA
 3001 TGTTAAATAG GAAATTAAC TGAAATCATT TTCAGATGTG ATTTTATAGCA
 3051 CTTATAGCCA TTTCAAACCA TGGTATTCAT TTATACTATG CTATTTATTG
 3101 TAAACTTCT TTTTTTTTCC AAGGAAAATA AGATAGTTTG CTTTATTTTA
 3151 AACAGTAAC TTTCTTATAT TGGGGCACTG ACCAAAATTC AATACTGGTA
 3201 CAAATATGTT ACCTAGGGGG TCAAATATG TGCCAGGTGA ATTTTCTGAA
 3251 TTTCTCTAAA GAGAGAATTT TAAACCTTAT AAAACAATTA GAAACAAGTG
 3301 AGTGAGAGGT GAGCATCAAC AACCTGTGTA ACATAAGCCA CAGTACAAAT
 3351 TTAAGCTGAA TAACCAAGCC ATGTCAGTTA TCCCAAATCA TTTTGTAA
 3401 TATTTAGGAG GATACACATA TTTCAATAA CTAAAAGTG AATCTTTACT
 3451 CCTATCTCTT AATACTCGAA GAAGTATAAC TTTCTTCTT TACTAGATTT
 3501 AAATAATCCA AATATCTACT CAAGGTAGGA TGCTGTCATT AACTATAGCT

FIG. 1 Cont.

3551 GAGTTTATCC AAAATAGAAA AATCATGAAG ATTTATAAAG CATTTTAAAA
 3601 ATAATCATTT ATAGCAAGTC CTGAAAGCT CTAAATAAGA AAGGCAGTTC
 3651 TCTACTTTCT AATAACACCT ATGGTTTATA TTACATAATA TAATTCAACA
 3701 AAACAGCATT CTGACCAATG ATAATTTATA GGAAATTCAT TTGCCAAGTA
 3751 TATGTTTTAT TATAAAGTTA ATATTTTGAC CAATCTTAA AATTTTAA
 3801 CTCTATTCTG ACATTTCCAG AAGTATTATC TTAGCAAGTC ATCTTTATGA
 3851 TACCACTTAT TAAACTGAAG AGAAACAAGA TGGTACATTC TGGGTTTAC
 3901 TTTAAAAGGG ATTTGATTCA ATAATTTGAT TTATCACTAC TTGAAAATTA
 3951 CATTTTCTTC CTCAGACTGG ATGGCAATGA GATGAAAGCA GCTTTCCTGG
 4001 CTCTCAACTT CCCTTCTTCA TCAATTTTTC CAGCGTTTCA TAAGGCCTAC
 4051 ACTAAAAATT CTAAACTAT ATATCACATT AATATAATTA CTTATAATTA
 4101 ATCAGCAATT TCACATTATC GTTAAACCT TTATGGTTAA AAAATGCAAG
 4151 GTAAGAGAAG AAAAAACAC ATTGAACTAG AACTGAACAC ATTGGTAAAA
 4201 TTAGTGAATA CTTTTCATAA GCTTGGATAG AGGAAGAAAG AAGACATCAT
 4251 TTTGCCATGT AACAGGAGAC CAATGTTATT TGTGATTCA GATTGTCTTT
 4301 GCTGGACTTC TTGGAGTCTT TCTAGCTCCT GCCCTAGCTA ACTATGTAAG
 4351 TCTCACCTTT TCAAGTTTGC TACCAAAATG CATTTGCAAG GAAATGTGAT
 4401 ATTAAATCAC TCTCAATCTC TTATAAACTT CAGAATATCA ACGTCAATGA
 4451 TGACAACAAC AATGCTGGAA GTGGGCAGCA GTCAGTGAGT GTCAACAATG
 4501 AACACAATGT GGCCAATGTT GACAATAACA ACGGATGGGA CTCCTGGAAT
 4551 TCCATCTGGG ATTATGAAA TGTAGGTAGT CAACGTGCAA TTTTCACTTT
 4601 ATGTGTTAAA AATACGACTT CTTTTTAACA AAAAATGTGC ATGTTAACCA
 4651 TAAAGAAATT AAAAATAAAT TCTAATTACA CATAGCATAC AGTTATAAGT

FIG. 1 Cont.

4701 AAAGGTGACC ATTTTGCTCA TCCGATTTTG TTCCCTAGAG ATAACACTG
 4751 TTAATAAGTG TTGCATGATC AGTTAAAATT CAAACCAACA AACACTATGT
 4801 TCAAGGGATT GTGGGTATAT ACAACAAATA TGAACATCCT TTGCCTTGC
 4851 CTGCAGATAC CCTCAATAAT GCTGAAAGAC TTATACAACA TTAAGCTTC
 4901 CAAAGCTTAG ACTATCTCAC TTTGTTTTCA AAGGAGGTTT TACGACCTC
 4951 TAAAGAGATT GAAATTGACA TTTCACCTAA AACTCGGGAA ATGTAAATGA
 5001 CAATATTAAT TGGTAAGAGA GGAAAGAAGA AAGAAAGAAG GAAGGAAAGA
 5051 AAGAAAGAAG GAAGGAAGGA AAGAAAGAAA GAAAGAAAGA AAGAGAGAGA
 5101 AAGAAAGAAA AAGAAAAAAG AGAGAAAGAG AGAAGGAAAG AAAGAGAGAA
 5151 GGAAAGGAAA AGAGAAGCAA AGAAAGAGAG GAGCAAAGAA AGGAACACTT
 5201 AGCACTAGTT GGGAGACCCA ACTCTGGAAT TATCAGCTAT ATATTTAACA
 5251 AACGTTATAC TTTTAAATAG CAACTCTTT ATTGTTTCAA TTTTATCTGG
 5301 TCAATTGGAA AAATAATTTT TGTCTTATCT GTCTCCTTGA AATGTGAGGA
 5351 TCAAAGGAGA CTAAAACATG ATAGCTTTTA AAGTCTATTT CAGTAAACA
 5401 GACTTATATA GAGGGGTTTT TATCATGCTG GAACCTGGAA ATAAAGCAAA
 5451 CCAGTTAGAT GCTCAGTCTC TGCCCTCACA GAATTGCAGT CTGTCCCCAC
 5501 AAATGTCAGC AATAGATATG ATTGCCAAGC AGTGCCCAT CCAGTGCTCT
 5551 TATCCCAGCT CATCACGATC TTGGAGTTCC CATTTCTCTC TGCAGGTGGA
 5601 ACTGACCTCT GATAAGAAAA GCTCCTCGGA GAACACATGC CTCCTATTT
 5651 GCCATCTACT TTAACAGGGC TTTGCTGCAA CCAGACTCTT TCAAAAGAAG
 5701 ACATGCATTG TGCACAAAAT GAACAAGGAA GTCATGCCCT CCATTCAATC
 5751 CCTTGATGCA CTGGTCAAGG AAAAGAAGGT AAAAATAAAA GGCTTTTAT
 5801 TTTTGGTGAG GGGAGAGGTT TTACATCCTT CAGTAAATAA CGAGAAGATC
 5851 ACAGTCATTC CCTCTTGAAT ACAGTATGTT GTAGTGTGCA GCACAAAGGG

FIG. 1 Cont.

5901 GGAAGTTATT GGTGATTGCC TGAGGGAAGG CAACTTCTGC CACATCAAAT
 5951 GCTGTGGCTC ACACCTACCT CTACAACCGC TGAGCAAAGC ACTTGAAACC
 6001 TTGACTGTTA GAGGAGCAAA GCTCTGGTCA CACCAATAGG AGCCTCAGTA
 6051 CTTTGCCAAG GACATTTTTC TGCAAGAGTT AGTTAGGGTT ATTAGATTTA
 6101 GCAAATGAAA ATAGAAGATA TCCAGTTAGG TTTGAATTTT AGGTAAGCAG
 6151 CAGGTCTTTT TAGTATAATA TATCCTATGC AATATTTGGG ATATACTAAA
 6201 AAAAGATCCA TTGTTATCTG AAATTCAAAT GTAAGTGGG ATTGTATATT
 6251 TTGTCTGGCC ATACTAATCC AGGTGAGTGG AAAGAAGAGA TCCATAATGT
 6301 TTTAAAATAT TTGCCTGAGT TCATATTCCT ATAAGTATA AATGAGTACC
 6351 TTTCATTGAC AAGGTAGAGA AAATAAATAA ACTGCATTCT CAGAAGATGA
 6401 TTATTACATA GTCTAATCCA AGGAATCTAT GATGACCAA TGAGGTCCAA
 6451 GTTGCAGAAT AAATTAAGCC TCAGACTTCT GTGTTTATGA GAAGCTGAGG
 6501 TTTCAAACCA GGTAAATCCC TTAGGACACT TAGAAATGCT AAGATATACA
 6551 GAATAAGCTA GAAATGGCTC TTCTTCATCT TGATTATGGA AAAATTTAGC
 6601 TGAGCAACAC TCACTGTTGG CCTCGTATAC CCCTCAAGTC AACAAACCAC
 6651 TGGGCTTGGC ATTCATTCTC TCCCATTCTT CTTTTCTACC TCTCTTTTCC
 6701 ACACTCAGCT TCAGGGTAAG GGACCAGGAG GACCACCTCC CAAGGGCCTG
 6751 ATGTACTCAG TCAACCCAAA CAAAGTCGAT GACCTGAGCA AGTTCGGAAA
 6801 AAACATTGCA AACATGTGTC GTGGGATTCC AACATACATG GCTGAGGAGA
 6851 TGCAAGGTGA GTAGCATCCC TACTGTGCAC CCCAAGTTAG TGCTGGTGGG
 6901 ATTGTCAGAC TATCCTCGCG CGTGTCCATA GTGGGCACCA GTGATGCAGG
 6951 GATGGTCATC AAGGCCAACA TTTGTGCAGT GCTTGCTCTG TGCCAGGTAC
 7001 GTTCTATGT GCTTTAAGTG TGTTAACTCG GTTCTTCACA GCAATCTTAT
 7051 AGGTTCTATT TTAATCCTAC TTTATGGATG AGGAACTGA GGTACAGAGA

FIG. 1 Cont.

7101 GGTCACAAAA TCCTTGCCTG GGTCAATTCC AAGCATTTTG GCTGTGGATT
 7151 CTGTGCTCTT AAATATTATG GAACACTGCC TTTTAAGTGT GAATCAAGAG
 7201 TAGACTCAAG TCATATTCAA AAGAATGCAT GAATGGCTAA ATGAAAGAAG
 7251 AATGCTAATA GAATCTATTA ACTTTCTATA GCTCAGACAA TCACTTAATT
 7301 TCTGGACATT CAAAGAACAG CTGCACACAA ACAAAGTGTC TACCTAGGGA
 7351 CCTAACTTAA TGGCAATTTT CCAGATCTCT GAATTGATTG ATTCATCAC
 7401 AACAAAGTAGA TAAACCTTGA CATTAGCACA TAGCTAGTTT GGAAACCCCT
 7451 ACTCCCCCAA TCCCCTCCAA GAAAAGAGTC CTAAATAGA CATTAATATA
 7501 GGCTTCTTCT TTTCTCTTTA TTAGAGGCAA GCCTGTTTTT TTA CT CAGGA
 7551 ACGTGCTACA CGACCAGTGT ACTATGGATT GTGGACATTT CCTTCTGTGG
 7601 AGACACGGTG GAGAACTAAA CAATTTTTTA AAGCCACTAT GGATTTAGTC
 7651 ATCTGAATAT GCTGTGCAGA AAAAATATGG GCTCCAGTGG TTTTACCAT
 7701 GTCATTCTGA AATTTTCTC TACTAGTTAT GTTGATTTC TTTAAGTTTC
 7751 AATAAAATCA TTTAGCATTG AATTCAGTGT ATACTCACAT TTCTTACAAT
 7801 TTCTTATGAC TTGGAATGCA CAGGATCAAA AATGCAATGT GGTGGTGGCA
 7851 AGTTGTTGAA GTGCATTAGA CTCAACTGCT AGCCTATATT CAAGACCTGT
 7901 CTCCTGTAAA GAACCCCTTC AGGTGCTTCA GACACCACTA ACCACAACCC
 7951 TGGGAATGGT TCCAATACTC TCCTACTCCT CTGTCCACTG CTAA

FIG. 1 Cont.

1 CATGCTTGCC TACTCCTCTG TCCACTGCTT TCGTGAAGAC AAGATGAAGT
51 TCACAATTGT CTTTGCTGGA CTTCTTGGAG TCTTTCTAGC TCCTGCCCTA
101 GCTAACTATA ATATCAACGT CAATGATGAC AACAACAATG CTGGAAGTGG
151 GCAGCAGTCA GTGAGTGTC ACAAATGAACA CAATGTGGCC AATGTTGACA
201 ATAACAACGG ATGGGACTCC TGGGAATTCCA TCTGGGATTA TGGAAATGGC
251 TTTGCTGCAA CCAGACTCTT TCAAAAGAAG ACATGCATTG TGCACAAAAT
301 GAACAAGGAA GTCATGCCCT CCATTCAATC CCTTGATGCA CTGGTCAAGG
351 AAAAGAAGCT TCAGGGTAAG GGACCAGGAG GACCACCTCC CAAGGGCCTG
401 ATGTACTCAG TCAACCCAAA CAAAGTCGAT GACCTGAGCA AGTTCGGAAA
451 AACATTGCA AACATGTGTC GTGGGATTCC AACATACATG GCTGAGGAGA
501 TGCAAGAGGC AAGCCTGTTT TTTTACTCAG GAACGTGCTA CACGACCAGT
551 GTACTATGGA TTGTGGACAT TTCCTTCTGT GGAGACACGG TGGAGAACTA
601 AACAATTTTT TAAAGCCACT ATGGATTTAG TCATCTGAAT ATGCTGTGCA
651 GAAAAAATAT GGGCTCCAGT GGTTTTACC ATGTCATTCT GAAATTTTTC
701 TCTACTAGTT ATGTTTGATT TCTTTAAGTT TCAATAAAAT CATTTAGCAT
751 TG

FIG. 2

1 MKFTIVFAGLLGVFLAPALANYNIDVNDNNAGSGQQSVSVNNEHNVAN 50
51 VDNNNGWDSWNSIWGYGNGFAATRLFQKKTIVHKMKKEVMPSIQSLDAL 100
101 VKEKKLQGKGGPPPKGLMYSVNPNKVDDLSKFGKNIANMCRGIPTYMA 150
151 EEMQEASLFFYSGTCYTTSVLWIVDISFCGDTVEN 185

FIG. 3

1 GAATTCAAAC AGCAGGCCAT CTTTACCAG CACTATCCGA ATCTAGCCAT
 51 ACCAGCATTC TAGAAGAGAT GCAGGCAGTG AGCTAAGCAT CAGACCCCTG
 101 CAGCCCTGTA AGCTCCAGAC CATGGAGAAG AGGAAGGTTG TGGGTTCAAG
 151 GAGCTTTTCA GAGTGGAAAT CTGTGGATCA GTGATTATA AACACAGTT
 201 TCCCCCTTTA TTAGATTTGA ACCACCAGCT TCAGTTGTAG AAGAGAACAG
 251 GTTAAAAAAT AATAAGTGTC AGTCAGTTCT CCTTCAAAC TATTTTAAAC
 301 GTTTACTTAT TTTGCCAAGT GACAGTCTCT GCTTCCTCTC CTAGGAGAAG
 351 TCTTCCCTTA TTTAATATA ATATTTGAAA GTTTTCATTA TCTAGAGCAG
 401 TGGTTCTCAT CCTGTGGGCC ATGAGCCCTT TGGGGGGGTT GAACGACCCT
 451 TTCACAGGGG TCACATATCA GATATCCTGC ATCTTAGCTA TTTACATTAT
 501 GATTCATAAC AGTAGCAAAA TTAGTTAGGA AGTAGGAACA AAATAACGTT
 551 ATGGTTGTGG TCACCACTAT GTTAGAGGGT CCGCAGCATT CAGAGGGTTG
 601 AGAACTGTTG TTCTAGAGGC AAATAAGAAG ACAGAGTTCC TTGATAGGGC
 651 CCAGAGGCAG TGAAAGAAGT TTCCACGTAG AAAGTGAAGA AGGTCTGGTG
 701 TCCGAAGCAG TGAGGAACTT AAAAAAGAA AACCAAAAC ATTGCCAACT
 751 AACAGTCCAG GAGAAGAGCG GGGCATGAAA GGCTGAGTTC CCATGGGATG
 801 CCTTGAATGG AATCAGAGTG TGGGAAAATT GGTGTGGCTG GAAGGCAGGT
 851 GCCGGGCATC TCAGACGCTG GTAGCTGGGG AACAGGAAA CCCCTTTAGG
 901 ATCCCAAGAT GCCATTCAA TGAGCTTGAG ATTTTCTCA TGGACTGCCA
 951 GTGAATGTTT CTACGCTCCG GAAATTAATG TTTACTTATT TTCCATATTC
 1001 TAGGGGAGAA CCCTGGGAAA AATGGAGGAC ATTCATTGAA ATATCTGAGT
 1051 CCTGGGATAA GGCAGGCTTG GTCCTACAAC TCTGGTAAAA GTCCATCAGG
 1101 AAGTGCCTTG ACCAAGGCTG GAGTGGAGAG CTGTTGGTGA GATGTAAGGG

FIG. 4

2301 TCCGGTCAGA CTGGAAGATC ACTGTTGTCA AACTAGTCT TCAACACTCT
 2351 TGGCTGTTAA CATGAAAACA ACGTCCTTG GGCCCTGTGC AAGCATTTCT
 2401 TGGAGAAAGT CTCTGGGGAT GAAGCTATCT CAGTTTCCCC ACTGAAGTCC
 2451 TAGGATACAG AGGCTCAAAC AGAGTGCACA TATTCAATTT CAGCATACTC
 2501 TATTGGCGCT GCTTTATGAA TCATATGAAT TTATGGAATT GGAAATGTAA
 2551 ACTATGACCA AGAAGCGTCC ACCTCAGAAC AGGTGGGTG GGGAACTCCA
 2601 AGCACAGGCC AGAGGGCTGC GTTCTCTTC TAGTTCTGTC TAGAGGAGTG
 2651 GTTCTCGACC TTCCTAATGC TGTGACCCTT TAATACAGTT CCTCACGTTG
 2701 TCGTGACTION CAGCCATAAA ATTACTTTCA TTGCTACTGC ATAACGTAA
 2751 TTTTGCTACC ATTATGAGTT GTAATGTAAA TATCTGATAT GCAAGATACC
 2801 AGATAACCTA AGAAACGGTT GTTTGACCTT TAAAGGGGTC ACAACCCACA
 2851 GGTGGAGAAC TACTGGTCTA GGGTCCTTTA CAGTCCTTTA GCTGCCTCAT
 2901 TTACAGGAGA TAACATCATG CTCAAAACT CCCTCCACAT TTGGCTTTTT
 2951 GGGTTGTTTT GTTTTGTTTT TCAAGACAGG GTTCTCTGT GTAGCCCTGG
 3001 CTGTCCTGGA ACTCACCTTT GTAGACCAGG CTGGCCTCGA ACTCAGAAAT
 3051 CCGCCTGCTT CTGCCTCCTG AGCGCTGGGA TTAAAGGCGT GCGCCACCAT
 3101 GTCTGGCTCA CATCTGGCTT TTAAAGAGAC CGATTTTAAC TTCTTGCATT
 3151 GAAAATAAAT ATAGTAGAAA TGCTTAACCT ACTAAGACAA TAAAAACAGG
 3201 ATTCCTTCTG CTAGGAAGAA CACGTTCCAG ACTAAGGAAA AAAACCTTTT
 3251 CAGGGCTTTC ATTACACTGT GCCATGCACT AATTTTATGT TTTCTTCATC
 3301 AGTTTTCACT GTCTGAAATT CAGTGTCAAA ATTCTAAGAC TACATATGAA

FIG. 4 Cont.

3351 TATCATTACA GTAAC TCAGC AATTCTATGT TACCAGTAAG TTTTCTGTA
 3401 GTTTAAAAAA AAGGTGGAAG AAGAAAGCAC AGATAGTTTA GCACATGGGT
 3451 AAAATCAGTA ACTATTCTG ATGAGCTTGG TGAAGATGCT GTAAACCATG
 3501 CGACCACCAG TCCTGTTCTC TGTGCTTTCA GATGTTGTC GTGGGTCTGC
 3551 TTGGCCTCCT TGCAGCTCCT GGTTTGTCTT ACGTAAGTCT CATTTTCTG
 3601 AAGTTCATTG TCAAACTGC ATTTACAGTG AAATGTGATC TTAAGTCACC
 3651 CTCTGCTTCT TATGAACATT AGACGGTCAA CATCAATGGT AATGATGGCA
 3701 ATGTAGACGG AAGTGGACAG CATTCGGTGA GCATCAATGG TGTGCACAAC
 3751 GTGGCCAATA TCGACAACAA TAACGGCTGG GACTCCTGGA ATAGCCTCTG
 3801 GGA CTATGAA AACGTATGTA ATGGACACAC AGGGTAAAGA TATGGTGTAG
 3851 CCACCACCCA TTA AAATTTC TGAGGTGAAT TCTAGCTGTT CATGAACATT
 3901 AAAAGCTACC AGTAAAGTG CCCATTCCAC TCAAAACAAT TTTACTTTT
 3951 TGCATATAAT TATTGCTAAT AAGTATTACA CAATAGGTCG AAATCAAAG
 4001 GGATCAATAG TAAGGATAAA AACTATGTAC AAAGACAAAC ACAGCATCCT
 4051 TTGGTCTTCC CTGCAGAGAG TCTCCATGAT GTTAAAGGTC CAATGTTTAA
 4101 TGGAGGCTGA ATGAAATACG AATGCCTCTG TGATGGAAAA GGCCCAACAT
 4151 CTTATGGAGA ATGAGTGAAG TATGAATGCT ATTAGTTGTA AGAGAAGGCG
 4201 ATGCAAAGCA ACACTTGGCA CCACCTGCCA ATTACTACTT TCCTATTTAA
 4251 ATGTAGTTTA AAAAGCAAAG CCTGTCTTCC CTGCCTCCTG GAAACACTGC
 4301 GGATGGAGGT AGACCAAGGT ATGACAGCCT TTA AAAGTTT GTCAGCAAAA
 4351 CACTCCCCCA TACACACATA CACACACCCT CCTACTACAC TGGA ACTGAA

FIG. 4 Cont.

4401 GCAAAGGCAG TGGGTTAGAT ATATCCACCC TCTAAGAGTT TGCAGGTCAT
 4451 CTATATATGA TAGCCAGAGA CACAACGCA GGACAGCCAG ACTCTGAGCA
 4501 CTCTCCCCAG CTCCTTG TAG CTCTGTTTCA GTGGTGA CTT GTGACAAGAA
 4551 TCCTGGGGAA CCTGTGCCTC ACTGTTCTCT GTCTTCTTTA ATAGAGTTTC
 4601 GCTGCCACGA GACTCTTCTC CAAGAAGTCA TGCATTGTGC ACAGAATGAA
 4651 CAAGGATGCC ATGCCCTCCC TTCAGGACCT CGATACAATG GTCAAGGAAC
 4701 AGAAGGTAAA GTCCTGCCTT CTTCTTTGGA GTGACAGGAA GTCTTACAGT
 4751 CTCCAGTACA CAGTGAAGTC ACCCCCATT CTTCTTTGGT GGAGCATGAC
 4801 AGCATGTTTG TCATGATAAA TGCCACAAAC ATGTAAACT GTTCAGTGTC
 4851 TGCCTGAATG GAGGGTGGCT TCCACTGTGT CAGATGCCGT GGCCACATC
 4901 TGCCTCTGCA GGTCCAGTA AAGCACTGGC TATCTTGAGT GTCAGAGACC
 4951 CAAAGGTCTG TACTTTCAG TACAAGCCCT CCATATTTCA AGGGCACACT
 5001 CCTACAGTCG TTGGGGTTAT CAGAACTAGC AAACATAGAG ACTGGATTTT
 5051 CAGATGAAAA GAAATCCTTT TTAAAGTCTA AGTATGCCTT ATACAATGTT
 5101 TGAGATATTC TCAATACTAA AAAAAAAAAA ATTGTTGCTT GCTTGAAAAT
 5151 CAAATGTAAC CAAGTGCCT ATATCCAGTG TCAATCATGG CTGTAGTAGA
 5201 TGGGAAGAGG GAGCCCGTGG TTTTCACAGT CAGACGCCTG AGTTATTCTT
 5251 CTAAGTGATA AATTGGTTCC TATAACAAGC AAGCCAGTGA ATATAAATAA
 5301 GCTCTATCTC AGAAGTTATC CTGTAGTGCT ACCCTAGAAT CTAAGAGAGC
 5351 AAAAGTGCTT CAAATTCAG AATAAGTTT GCTTTGGACT TCTGTTTTTC
 5401 TAAACAATA TAACTTCAAA CCATCTAAGC CTCGTGGGAC ACTTAGAAAT
 5451 ACCAAGCCAT TCAAAGCTAG AATTGTTTCT TCACCTTACT TGAAAACAAA

FIG. 4 Cont.

5501 ATGACAACCA AAAATTGTCC CCACTGCCCT TGTACATCTT CAGATCAGTA
 5551 AAGTCCTGGG CTCAGGGATC ATTCAC TTTCCTTTCCT TTCACACTCA
 5601 ACTTCAGGGT AAAGGGCCTG GAGGAGCTCC TCCCAAGGAC TTGATGTACT
 5651 CCGTCAACCC TACCAGAGTG GAGGACCTGA ATACATTCGG ACCAAAGATT
 5701 GCTGGCATGT GCAGGGGCAT CCCTACCTAT GTGGCCGAGG AGATTCCAGG
 5751 TGTGTACCCT GAGATGCTGT ATATCCCAAT GCAGTACTGA GAGAGCCATC
 5801 AGACACTCTA AAGTGTGACC ACAGACGGAC CAATCATGTG GATTATCAGA
 5851 GCAAACACTT GCTTGCTCCT TGTCAGACAG TTGTCCATGC TTCAAAAGTT
 5901 CATTAAAAAA AATAGTTCAC AGGCTCCTCA CAGAAACCTT AGTAGAATCC
 5951 ACAGCTTCTG CTCTTAGTCT TACTTTTAG AACTGAGAC CCAGAGAAAG
 6001 GTCACAAAAC TTTTGTCTGG CTCAGGTTCT ATGTCTTTAA CTTTATAGAA
 6051 TACCGTCTTT CTGGGTGGGT GGGCTCTAGA GTAAACTTCA AGTGAGTTCA
 6101 AGGAAAGCAT GAGAAGTAGG GAAGACCAA TGAAAGGAGA ATGCCAATGA
 6151 AATCTATCGA TTCTATAGCG CCAATGCTTA ACTCCTAGGC GTTCAAAGAA
 6201 TAGTATCCAC AAGGTGTCAG CCTAAGATCC TAATCTAACA GCAAGTTTTC
 6251 AGATCTCTGA AGTGAAAAGA GAAAGCAAGA GAGGAACAGA GACAGAAACA
 6301 GTAAGAGACA GAGAGGCAGA GACAAAGAGA CAGGGAGAAT AGAGAGGGAT
 6351 TAAAATTAAAT ATATAGTTTA GAAATTACGA CTCCTCACAG TCCCTGCAGA
 6401 GTCCTAGGAT AGGCACTGAT TTGGACTTCT TTTCTTCTCA CTAGGACCAA
 6451 ACCAGCCTTT GTACTCAAAG AAGTGCTACA CAGCTGACAT ACTCTGGATT
 6501 CTGCGGATGT CCTTCTGTGG AACATCAGTG GAGACATACT AGAAGTCACA
 6551 GGAAACAAC CCGTGGGCTC TGACCATCGC AATGCTTGAT TATGAGAGTG

FIG. 4 Cont.

6601 TTCTCTGGGG GTTGTGATTA GCTTCTTTAA GGCTCAATAA ACCCACGTGG
 6651 CAGCACATCC AGTTTGTAAT GACATGCCTC ATGACTTCTA TGGGAGTCCA
 6701 ATGTGGCACC TGCCAGCCTG TATTCAGGAC CTCTCCGCTA TAAAGCATCC
 6751 CTCCAGAGTT TTCAAATACT ACAAAGCACA GCCTGGGTTT GGGCTCAGAT
 6801 AGGCCACTGC TGCCTGACTA CATTACAGAC AAACAAGTTT TAAAAGAAAG
 6851 AAAAAAGAGC TCAGAGTGGC TGGAATCAGC AAGGGTGTTT TTCCTGCAAG
 6901 GAGCCAGAAG TATCAATAAT CACCCAAGGA GGAGACACTG GGAATGAGAG
 6951 ACTAGAACAC ACGCCTGCAG ATACGGAGAA CCTCAGCATT GCCGCTCTCT
 7001 CCCATAACTG CACACCCCCT TCTGTAAACT CTGCTTCTTT CTTTCACCTG
 7051 AAGATGGCCC TTGCTTTTTT TTATTATAGG ACANGATAAC TAGACCAGAA
 7101 AGTCAACCTG ACTCTCTACA TTTATATGTC TTCCCAGNTC AAGAAATATT
 7151 ATTTACTGGT GAATGGCACT TCTATATTCC CTTGGTTCAA TAAGTCTACA
 7201 GGATCCATTC ATTGACAGGC CAAGAGTGAG ATCACATGAT ACCCAAGCAC
 7251 ATGGGTCTTT CCTTGAAGGA GAAGGATCCA

FIG. 4 Cont.

1 atgcctgact tctcacttca ttgcattggt gaagccaaga tgaagttcac
 51 aattgccttt gctggacttc ttggtgtctt cctgactcct gcccttgctg
 101 actatagtat cagtgtcaac gacgacggca acagtgggtg aagtgggcag
 151 cagtcagtga gtgtcaacaa tgaacacaac gtggccaacg ttgacaataa
 201 caatggatgg aactcctgga atgccctctg ggactataga actggctttg
 251 ctgtaaccag actcttcgag aagaagtcatt gcattgtgca caaatgaag
 301 aaggaagcca tgccctccct tcaagccctt gatgctgctg tcaaggaaaa
 351 gaagcttcag ggtaagggec cagggggacc acctcccaag agcctgaggt
 401 actcagtcaa cccaacaga gtcgacaacc tggacaagtt tggaaaatcc
 451 atcgttgcca tgtgcaaggg gattccaaca tacatggctg aagagattca
 501 aggagcaaac ctgatttcgt actcagaaaa gtgcatcagt gccaatatac
 551 tctggattct taacatttcc ttctgtggag gaatagcgga gaactaa

FIG. 7

1 MKFTIAFAGL LGVFLTPALA DYSISVNDDG NSGGSGQQSV SVNNEHNVAN
51 VDNNGWNSW NALWDYRTGF AVTRLFEKKS CIVHKMKKEA MPSLQALDAL
101 VKEKKLQKGK PGGPPPKSLR YSVNPNRVDN LDKFGKSIVA MCKGIPTYMA
151 EEIQGANLIS YSEKCISANI LWILNISFCG GIAEN

FIG. 8

1 MKFTIAFAGL LGVFLTPALA DYSISVNDDG NSGGSGQQSV SVNNEHNVAN
51 VDNNGGWSW NALWDYRTGF AVTRLFEKKS CIVHKMKKEA MPSLQALDAL
101 VKEKKLQGKG PGGPPPKSLR YSVNPNRVDN LDKFGKSIVA MCKGIPTYMA
151 EEIQGANLIS YSEKCISANI LWILNISFCG GIAEN

FIG. 9

Species	Position	Sequence	Position
Human	1	MKFTIVFAGLLGVFLAPALANYNIDVNDDNNNAGSGQQSVSVNNEHNVAN	50
Pig	1	MKFTIAFAGLLGVFLTPALADYSISVNDDGNSGGSGQQSVSVNNEHNVAN	50
	51	VDNNNGWDSWNSIWDYGNNGFAATRLEFQKKTCTIVHKMKKEVMPISIQSLDAL	100
	51	VDNNNGWNSWNALWSYRTGFAVTRLFRKKSCIVHKMKKEAMPSLQALDAL	100
	101	VKEKKLQGKGPGGPPPKGLMYSVNPKNVDDLKFGKNIANMCRGIPTYMA	150
	101	VKEKKLQGKGPGGPPPKSLRYSVNPNRVDNLDKFGKSIVAMCKGIPTYMA	150
	151	EEMQEASLFFYSGTCYTTSVLWIVDISFCGDTVEN	185
	151	EEIQGANLISYSEK CISANILWILNISFCGGIAEN	185

FIG. 10

	1				50
Human	MKFTIVF.AG	LLGVFLAPAL	ANYNIDVN.D	DNNNAGSGQQ	SVSVNNEHNV
Pig	MKFTIAF.AG	LLGVFLTPAL	ADYSISVN.D	DGNSGGSGQQ	SVSVNNEHNV
Mouse	MKLTM.FVVG	LLGLLAAPGF	A.YTVNINGN	DGNVDGSGQQ	SVSINGVHNV
	51				100
Human	ANVDNNNGWD	SWNSIWIDYGN	GFAATRLFQK	KTCIVHKMNK	EVMPSIQSLD
Pig	ANVDNNNGWN	SWNALWDYRT	GFAVTRLFEK	KSCIVHKMKK	EAMPSLQALD
Mouse	ANIDNNNGWD	SWNSLWDYEN	SFAATRLFSK	KSCIVHRMNK	DAMPSLQDLD
	101				150
Human	ALVKEKKLQG	KGPGGPPPKG	LMYSVNPKNV	DDLKFKGKNI	ANMCRGIPTY
Pig	ALVKEKKLQG	KGPGGPPPKS	LRYSVNPNRV	DNLDKFKGSI	VAMCKGIPTY
Mouse	TMVKEQK..G	KGPGGAPPKD	LMYSVNPTRV	EDLNTFGPKI	AGMCRGIPTY
	151			188	
Human	MAEEMQEASL	FFYSGTCYTT	SVLWIVDISF	CGDVTEN	
Pig	MAEEIQGANL	ISYSEKCISA	NILWILNISF	CGGIAEN	
Mouse	VAEEIPGPNQ	PLYSKKCYTA	DILWILRMSF	CGTSVETY	

FIG.11

Figure 1. The ^{13}C NMR spectra of the polyimides 1a and 1b. The chemical structures of the polyimides 1a and 1b are shown in the inset.

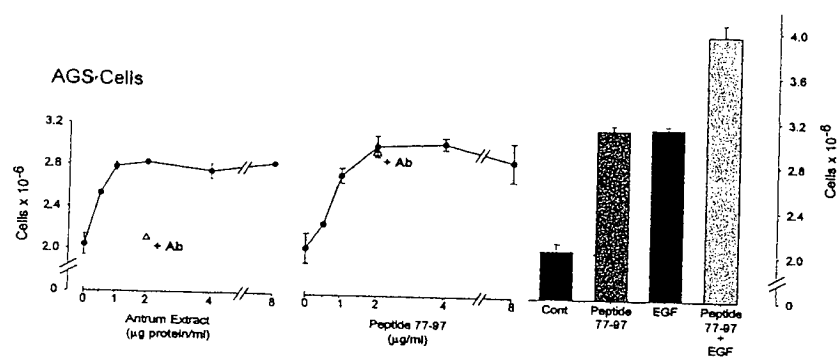


FIG. 12

Human

2300 90 1096 933 681

E1 I1 E2 I2 E3 I3 E4 I4 E5 I5 E6

Mouse

1580 90 781 905 696

E1 I1 E2 I2 E3 I3 E4 I4 E5 I5 E6

FIG. 13